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Report

POLICY DISCUSSION PAPER: ENERGY CONSERVATION IN RESIDENTIAL APARTMENT BUILDINGS

Prepared for the Residential Policy Section,
Energy Conservation and Oil Substitution Branch,
Energy, Mines and Resources Canada

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POLICY DISCUSSION PAPER: ENERGY CONSERVATION IN RESIDENTIAL APARTMENT BUILDINGS

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Executive Summary

The Bureau of Management Consulting was requested by the Residential Policy Section of the Department of Energy, Mines and Resources (EMR) to provide assistance in assessing the needs and opportunities for developing an energy conservation policy and program for medium and high rise and condominium apartment buildings in Canada.

During the course of the project, contacts were made with representatives of the federal and provincial governments, utility companies, builders and developers, and owners, to obtain their perceptions of the problems involved in developing and implementing an energy conservation policy for apartment buildings. Their viewpoints, plus information attained from available documentation, provided the input to the preparation of this discussion paper.

The major observations and findings reached during the course of the project were:

(1) several possible opportunities exist for the Canadian federal government through the Department of Energy, Mines and Resources to impact favourably on energy conservation within residential apartment buildings;

(2) at this stage of policy development, the opportunity appearing most likely to succeed is an increased emphasis on producing and transferring energy conservation information;

(3) the major barriers to the uptake of energy conservation measures by landlords, lie in the area of financial incentives (particularly tax and regulatory disincentives) and in lack of knowledge of the costs and benefits of energy conservation methods and improvements.

The major conclusion resulting from this project is that EMR needs to make a policy direction decision as to how it intends to influence energy conservation in residential apartment buildings. With this in mind, a range of five policy options was prepared at the request of the client.

Finally, to give time for policy consideration and regardless which policy option is decided upon, an improved exchange of energy conservation information among the various players can be acted upon immediately at little cost and with probable significant benefits.

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Note:

The client has been provided with copies of the documents listed in Appendix A in a separate volume.

PART ONE: INTRODUCTION

Part One indicates the purpose of this discussion paper, the basic approach and methodology used in carrying out the project, and the contents of subsequent Parts.

1.1 Purpose of Discussion Paper

The Bureau of Management Consulting was requested by the Residential Policy Section of the Department of Energy, Mines and Resources (EMR) to provide assistance in assessing the needs and opportunities for developing an energy conservation policy and program for medium and high rise and condominium apartment buildings in Canada. The purpose of this discussion paper is to develop a range of policy options for energy conservation in apartment buildings and to present a possible program scenario for implementing one or more aspects of these policy options.

A large number of players would be involved in and/or affected by policy on energy conservation in apartment buildings. These players include: landlords (owners/investors); managers/superintendents; tenants; federal government; provincial/territorial governments; municipal governments; and utility companies. Each player has a different perspective and vested interest. For a policy and program to succeed, their design will have to be sensitive to the needs of all the players.

Limitations of time did not permit an examination of the issues affecting all the principal players. Because owners/investors (i.e., landlords) are usually the principal decision makers with regard to energy conservation improvements within their buildings, the focus in this discussion paper will be on this player.

1.2 Approach and Methodology

The general approach taken to conduct this work was a standard one in such an undertaking. A brief review of the literature was made to try and determine what information was applicable to residential apartment buildings. A second task was to find out what existing programs or related research (if any) were applicable to these buildings. Both these steps provided useful information, but were not sufficient to indicate exactly how to develop an appropriate policy or program. It became obvious that new ground was being broken when it came to policy and program development for energy conservation in residential apartment buildings.

The third task was to consult with various players (potential participants) that would be involved in and/or affected by the policy. The players included:*

- federal government personnel, particularly at EMR, Canada Mortgage and Housing Corporation, and Statistics Canada;
- provincial government personnel, usually situated in housing and/or energy conservation ministeries;
- associations of buildings owners and managers;
- individual owners of buildings;
- companies that conduct energy audits;
- executives from utility companies.

This third step was most useful in determining what policies might be helpful, and what programs could and have worked. It was also helpful to flush out the realities of the situation that cannot be captured from examining statistics.

As a result of these three tasks, a range of policy options and a set of criteria were developed with which to assess the options. The objective of the assessment was to determine which policy option is most cost-effective subject to acceptability in the market place and government economic restraints. The assessment criteria and the policy options are presented in Part Five.

During the course of the project, meetings had been held with the client organization to review the ongoing progress and findings and to clarify the direction for continuing the project. These briefing meetings were an important element in developing reasonable policy options and an eventual strategy for program implementation.

Several methods of quantitative analysis were possible, all of them revolving around costs and benefits. Basically, the questions were: (a) costs to whom?: and (b) benefits to whom? Because of the multiplicity of players in the residential apartment population, costs and benefits have to be considered for each. The underlying factor, however, in whatever technical methods of analysis are used, is calculated energy savings which can be translated into dollars saved, regardless of the particular player.

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* See Appendix B: Acknowledgements.

1.3 Organization of Discussion Paper

This discussion paper contains five main parts, in addition to Part One: Introduction. These main parts are:

Part Two: Descriptive Information

Part Two shows the market size of the residential apartment building sector and the players involved.

Part Three: Typology of Landlords

Part Three provides a detailed typology of landlords.

Part Four: Related Research

Part Four provides examples of related research which has been undertaken recently to improve the energy conservation efficiency of residential apartment buildings.

Part Five: A Range of Policy Options

Part Five presents a discussion of the underlying needs and opportunities, a number of options as discussed with the client, and a number of assumptions and criteria relative to the options.

Part Six: A Possible Integrated Program Scenario

Part Six presents a series of integrated program steps to be considered for implementation.

PART TWO: DESCRIPTIVE INFORMATION

Part Two provides some statistical information on the number of apartment units in Canada, and identifies the principal space heating fuel used in apartment buildings

2.1 Market Size

The population to which the new policy and program would apply is existing residential buildings of four (4) storeys and more. As shown in Figure 1*, in Canada, the total number of apartment units constitute 25.3% of the occupied private dwellings, of which 16.3% are in apartment buildings of less than 5 storeys and 9.0% are in buildings of more than 5 storeys. This information does not breakdown the apartment buildings from 4 storeys and above.

For purposes of examination and analysis, the figures for more than 5 storeys and above will be used. It must be kept in mind that 4 storey apartment buildings have been excluded, though the policy and program would apply to them as well.

The following comments need to be made on Figure 1:

a. although 9% is a small percentage of total occupied private dwellings by structural type, it could be a very significant percentage in terms of energy consumption; and

b. at this time, figures are not available to show the amount of energy consumed in this 9% dwelling category, i.e., apartments of more than five storeys.

Ontario has by far the largest number of apartment buildings of five storeys or more. This is significant in that some energy conservation programs in residential apartment buildings have already been applied with a good degree of success. The experience relative to energy conservation programs in this province is likely transferable to other areas.

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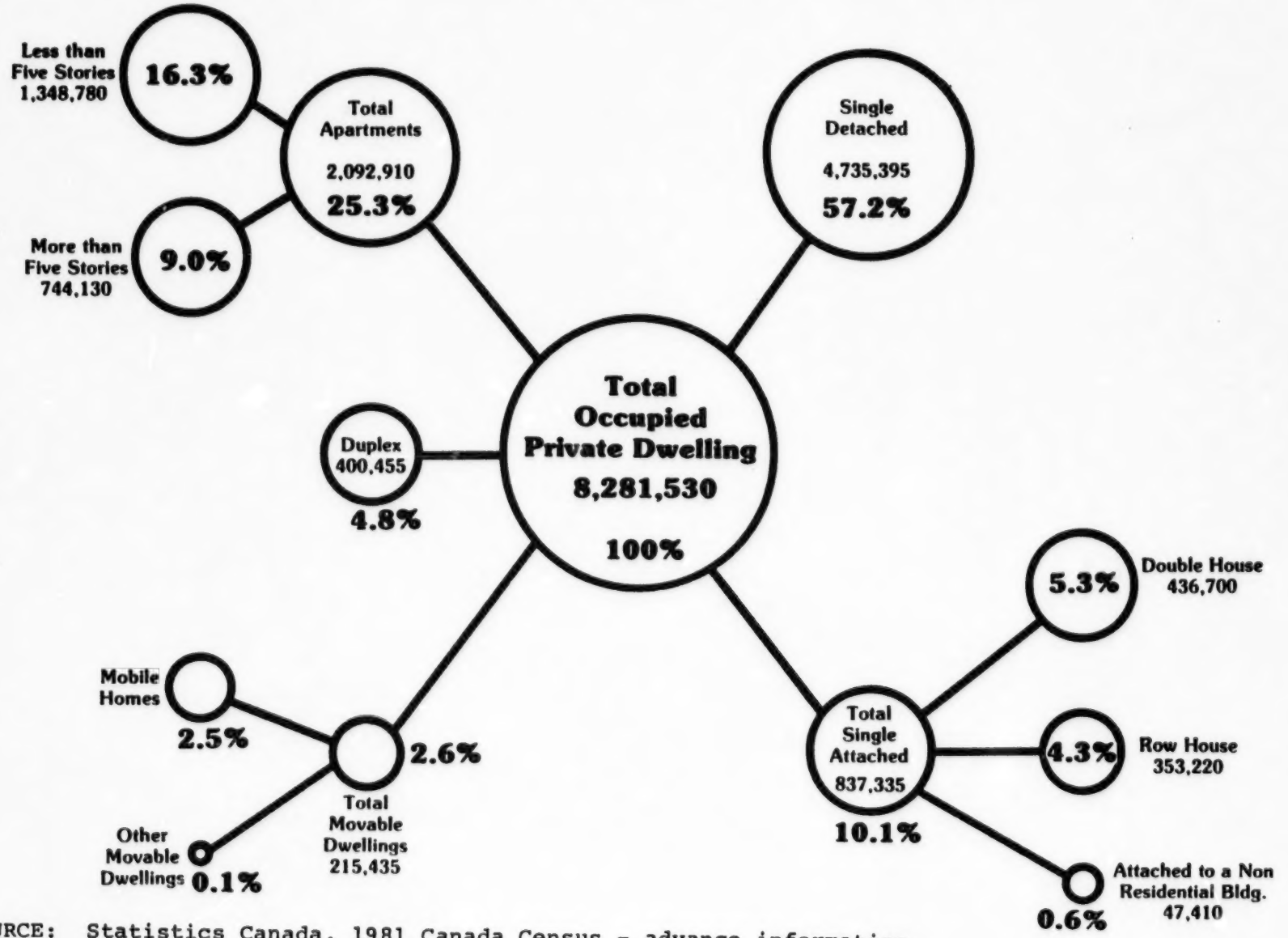
* Figure 1 was prepared from the 1981 Canada Census, Total Occupied Dwellings, for Canada and the Provinces, 1981 - Advance Information. More detailed information should now be available from Statistics Canada, Catalogue Nos. 92 - 903 (Canada and the Provinces) and 93 - 913 to 93 - 924 (Sub-Provincial Areas).

Figure 1 **Occupied Private Dwellings By Structural Type**



SOURCE: Statistics Canada, 1981 Canada Census - advance information.

In a report previously prepared for EMR*, additional statistical information was gathered on market size and age of apartment units by region in Canada and on tenure. This information is presented in Tables 1 and 2.

2.2 Principal Space Heating Fuel

Unpublished Statistics Canada material from 1981 shows the principal space heating fuel by type of dwelling by province for the year 1980. The residential apartment category (the focus of this study) is included in the apartment units or flat category. This information is of use in indicating the percentage of principal heating fuel. This percentage distribution is illustrated in Table 3 below.

TABLE 3

PERCENTAGE DISTRIBUTION PRINCIPAL SPACE HEATING FUEL IN APARTMENT UNITS OR FLATS

	Percentage Distribution of Principle Space Heating Fuel in Apartment Units or Flats		
	Oil	Gas	Electricity
TOTAL CANADA	33.%	37.%	28.%
• Nfld.	(1)	0.	63.
• P.E.I.	100	0.	0.
• Nova Scotia	80.	0.	19.
• N.B.	58.	0.	41.
• Quebec	50.	12.	39.
• Ontario	24.	52.	22.
• Manitoba	(1)	52.	41.
• Sask.	(1)	92.	(1)
• Alberta	0.	98.	(1)
• B.C.	17.	54.	27.

(1) insufficient data for Sample Size.

Source: Prepared from unpublished Statistics Canada material.

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* Office and Medium to High-Rise Residential Building Population Study, D.C.H. Consultants Inc., Ottawa, 1982.

TABLE 1

NUMBER OF APARTMENT UNITS IN MEDIUM TO HIGH-RISE STRUCTURES BY AGE AND LOCATION IN CANADA

Period in which Apartments were Built	LOCATION											
	British Columbia		Prairie Provinces		Ontario		Quebec		Atlantic Provinces		Canada	
	Units	%	Units	%	Units	%	Units	%	Units	%	Units	%
- 1981	43,427	13.6	77,054	24.1	106,211	33.2	83,958	26.2	9,506	2.9	320,156	100
- 1975	43,316	13.0	44,088	13.3	147,923	44.6	39,131	26.9	7,349	2.2	331,807	100
- 1970	38,902	12.1	43,625	14.8	118,073	40.0	89,239	30.3	5,093	1.7	294,932	100
- 1965	21,259	12.1	21,072	12.0	66,743	38.2	63,463	36.3	2,370	1.4	174,907	100
- 1960	9,651	8.1	9,452	8.0	44,069	37.2	54,352	45.9	892	0.8	118,416	100
- 1956	27,309	5.1	42,855	7.9	133,869	24.7	319,851	59.1	17,611	3.2	541,495	100
TOTAL	183,864	10.3	238,146	13.4	616,888	34.6	699,994	39.3	42,821	2.4	1,781,713	100

NOTE: Table 1 was prepared by D.C.H. Consultants Inc., as part of 1982 study. The source for the information in the material was from Statistics Canada, Table 2A Census Canada 1976.

TABLE 2

APARTMENT STOCK BY TENURE-CANADA

	%	1979 Units	%	1981 Units	%
Owned	100	286,474	12	291,751	12
Condominiums (High Rise)	35	100,000		102,113	
Small Buildings	65	186,464		189,638	
Rented	100	2,100,742	88	2,129,513	88
Private	88	1,848,652		1,882,770	
Medium to High Rise				1,252,835	
Low Rise				619,936	
Non-Profit	5	105,637		106,976	
Public	7	147,051		149,766	
TOTAL		2,387,206	100	2,431,264	100

Source: Census Canada, 1981; Canada Mortgage and Housing Corporation, Housing Management Problems in Canada, February 1981; Table 2A.

PART THREE: TYPOLOGY OF LANDLORDS

To achieve energy conservation improvements in residential apartment buildings, it is necessary to motivate landlords. Preliminary discussions suggested that the most important factor to motivating landlords is financial incentives. The accounting firm of Ernst and Whinney was asked to investigate what financial measures would be likely to motivate landlords. As a result, a typology of landlords was defined according to three main considerations, namely, landlord type relative to:

- rent control status;
- tax status; and
- economic/legal status.

This part presents the observations and findings from the Ernst and Whinney work.

3.1 Rent Control Status

Rent as a Function of Expenses ("LI")

This type of landlord are owners who are fully subject to rent control. Increased rents can be obtained by them only if they can demonstrate increases in expenses. Accordingly, any savings in operating costs would have no "bottom line" effect to such a landlord, as reduced operating costs would usually be matched by reduced revenues. Typically, this type of landlord is someone who has bought his property with a high proportion of equity or has owned the property for a long time and usually enjoys favourable financing.

This type of landlord would not likely be motivated by reductions in operating costs even if the capital cost of an energy conservation measure was 100% reimbursed.

Rent Partially Subject to Controls ("L2")

This type of landlord is subject to rent controls and, for various reasons, has not been able to impose rents which fully compensate him for his expenses. That is, his rental increases are determined by other factors such as percentage increase from the previous year's rent, political environment, etc. To this type of landlord, a deduction in operating expenses through energy savings would "flow to the bottom line" (before income tax) as his rental income would be unaffected by changes in expenses.

Alternatively, he may possibly be a landlord who is controlled but whose rental rates are already subject to market competitive forces.

Typically, a landlord such as this would be someone who has recently purchased a building with a low down payment and/or high interest rate financing; alternatively, he may be a person who has to refinance an old, low-interest rate mortgage at current rates. In either case, the high increases in financing costs has created such a substantial operating loss on the property that rent controls require rent increases to be phased in over a number of years.

This type of landlord would likely be highly responsive to measures that would reduce operating costs.

Rent Uncontrolled ("L3")

This type of landlord is a person whose revenues are not determined by rent controls. He may be exempt from rent controls because the property is newly built or it qualifies as "luxury accommodaton" whose rent is above the ceiling set by the rent control legislation. Alternatively, this landlord could also be a government housing agency. In all cases, these landlords' revenues are a function of market forces and are not affected by expense fluctuations. Accordingly, any savings in operating costs would drop to the bottom line.

This type of landlord would likely be responsive to energy conservation measures which would reduce his operating costs.

3.2 Tax Status

Fully Taxable on Rental Income ("TI")

This type of owner is fully taxable on his rental income as revenues exceed the aggregate of operating costs, financial costs and capital cost allowance (CCA). This status will mean:

a. Any reduction in expenses will increase income that is fully taxed. Accordingly, the cash flow advantage of any expense saving would be (assuming a 50% tax rate) approximately 50% of the actual expense reduction.

b. This type of owner would be highly responsive to tax-based incentives which reduce his tax liability.

The typical owner in this position would be somebody who has owned a property for a long time and whose rental income increases have outpaced expenses; this result often occurs because of favourable financing, the cost of which has remained fixed. In addition, the long ownership history has usually meant that CCA claims have been nearly fully

exhausted. Alternatively, a person who buys a property with a high amount of equity (e.g., a foreign investor or a financial institution) could also exhibit these types of attributes.

Rental Loss Offsettable Against Other Income ("T2")

This type of property owner has positive taxable income, but has been able to reduce the amount thereof by offsetting the rental losses from the property against income from other sources. The income tax position means:

a. Same as a) in "T1" above.

b. He will be responsive to selected tax-based incentives. In general, these incentives would have to either increase the amount of claimable tax loss from the property or produce some type of a tax credit which could be offsettable against other tax liabilities.

Typical owners who fall into this pattern include a wide range of possible owners. Some examples are:

- Investors in multiple-unit residential buildings ("MURBS').
- Integrated real estate developers (also known, from a tax point of view, as "principal business corporations" -- PBCs) who will use rental losses to offset profits from sale of houses and lots or rental income derived from the ownership and operation of other buildings.
- Owners of non-MURB properties acquired with a high ratio and/or a high interest rate debt financing.

Not Taxable on Rental Income -- No Offset ("T3")

This investor usually owns a property which exhibits a positive cash flow which is then sheltered through the claiming of CCA. As their properties do not produce tax losses, there are no tax benefits associated with applying real estate losses against other income. Owners in this category are usually persons who acquire property with a reasonable down-payment or who have owned a property for a period of time and have a sufficiently high degree of equity so that financing costs are not producing cash rental losses. This particular tax status will mean:

a. Any reduction in operating cost will be fully translated into a corresponding cash flow improvement (assuming the incremental income can be sheltered through CCA).

b. The responsiveness of this type of investor to tax incentives is indeterminate. If he foresees being in a zero taxable income position for a substantial period of time because of available CCA claims, then he may not be responsive to any tax incentives which merely produce additional write-offs. He would be responsive to incentives which can reduce tax liabilities arising from other income that he may have; similarly, if he perceives his tax shelter from CCA expiring in the near future, then incentives that provide increased write-offs may be attractive to him.

Not Taxable At All ("T4")

This type of investor has no taxable income. Typically, this type of taxpayer is involved only in real estate and has sufficient rental losses and "soft costs" to offset any other income that he may enjoy; alternatively, he may not be taxable under the Income Tax Act. This tax status means:

a. Any savings in operating costs will be matched by a corresponding and equal bottom line effect as before-tax dollars equal after-tax dollars for this type of landlord.

b. This investor will not be responsive to any tax-based incentives as he already pays no tax.

Typical examples of this type of landlord include the integrated real estate companies that are able to fully shelter their income through rental operations and other soft costs, individual investors who acquire sufficient real estate tax shelters to fully shelter their income, tax-haven based foreign investors, and pension funds.

3.3 Economic/Legal Status

Large-Scale Integrated Developers

These companies have typically engaged in a wide range of real estate activities including land development, house building, apartment construction for syndication to investors, apartment construction for themselves, operation of commercial rental

properties, etc. They have highly-sophisticated management teams that are capable of assessing the costs/benefits associated with energy conservation projects including the effects on operating costs, marketability and public image.

Recently, a combination of removal of tax incentives, high interest rates, rental controls and landlord and tenant legislation have induced many of these companies to vacate the residential rental field. This shift has been marked by a refusal to undertake new residential rental projects and/or a liquidation of existing portfolios.

To the extent they continue to own and operate rental properties, these companies usually have internal property management divisions. In some cases, they will also administer properties for investment syndicates or arm's-length property owners for a fee.

Foreign Investors

This group has always been active in acquiring Canadian residential rental properties. Typically, they are motivated not so much by immediate returns on investment, but they usually look for a safe economic and political haven for their capital; real estate is usually chosen because of its ability to preserve real capital in times of inflation. They usually acquire properties with the intention of holding them for a long time. These investors will usually acquire properties with high cash down-payments. Although historically, all-cash deals were not unusual, more recently foreign investors have been using financing to provide a break-even operation so that no Canadian taxes are eligible on the rentals.

These owners usually tend to use professional property management firms and afford them considerable discretion in running the property. They usually maintain a very low profile as owners, often using Canadian nominees who hold title. This anonymity is usually motivated by a desire to avoid detection by their domestic tax, exchange control or political authorities regarding the capital that has been sequestered in Canada. To a lesser degree, many foreign investors do not wish to draw attention to themselves for fear of possible adverse political action in the future by the Canadian government.

Tax Shelter Investors

In recent years, a large number of individual groups have, through syndicates, acquired small interests in one or more residential projects. Usually these investments are motivated first by a need to shelter taxable income and, secondly, by investment criteria. As most of these types of syndications are usually accompanied by cash flow guarantees, the properties are managed by the developer or promoter who formed the syndicate. Under the terms of a typical cash flow guarantee, outlays are borne by the investors. In these circumstances, property managers would be highly receptive to capital outlays that reduce operating costs. The beneficial owners of the property usually undertake a very passive involvement in ownership and operation (in some cases the owners have never even seen the property).

Pension Funds and Financial Institutions

Although these types of investors have historically concentrated on commercial properties, recent "bargains" in residential real estate are slowly inducing these types of firms to examine residential real estate as an investment. Some of these investors are taxable financial institutions; others are tax-exempt pension funds. They will usually employ professional management companies to run the properties, although the larger financial institutions may have "captive" property management companies. These types of owners are usually sophisticated financial managers and, accordingly, will analyze the cost/benefit attributes of an energy conservation investment closely and will make decisions based on internal rate of return criteria.

Residential Developers

Certain large corporations have resisted the integration/diversification trends and have specialized in strictly residential real estate. These companies are privately owned by highly knowledgeable owners and operators of residential properties and have in-house property management divisions. Typically they have owned their building for a long time and are subject to rent control. This long history of ownership has usually meant that they have a limited capacity to raise rents; that is, rents must usually be supported by expense increases. In many cases, these owners are selling their properties to purchasers who have a better capacity to raise rents. The new owners are able to obtain rents based on expenses which include the cost resulting from financing the purchase at current market rates of interest. However, the Ontario government has recently introduced regulations to limit any rent increase due to refinancing, even with purchase, to 5%.

Other Investors

Difficult to quantify or typify is the average "small" investor in residential real estate. This could be anyone from a businessman or professional person who has invested in a small apartment building, alone or jointly, as an inflation hedge or as an investment. Many of these owners have, in fact, owned the properties since before 1972 when all rental real estate qualified as a tax shelter. Although generalizations are difficult, it may probably be concluded that these owners regard all outlays, capital or operating, as a cash drain and will, accordingly, view energy conservation decisions more on the basis of an immediate cash drain than long run returns.

Psychological Response to Incentive Programs

In previous sections of this discussion paper, it was suggested that by objective financial criteria certain owners of residential properties may not be expected to be responsive to tax incentives. Conversely, the Ernst and Whinney experience has indicated that many developers have such an abhorence towards paying tax that they will avail themselves of any tax incentives even if they foresee no immediate use for it (provided the project makes economic sense).

The "smaller" investor may also be more responsive to tax-based incentives, whether he can use them or not, as these incentives are perceived to be automatic. That is, undertaking a prescribed action automatically makes the incentive available. In contrast, a small investor may not avail himself of incentives if they require cumbersome application procedures. The rewards may simply not justify the time and effort involved in obtaining the grant/subsidy.

3.4 Conclusion

The obvious conclusion from this part of the report is that the typology of landlords is very complex. The complexity is illustrated in Figure 2. which shows the types of landlords according to both rent control status and tax status, and what sorts of financial incentives are most likely to succeed in encouraging landlords to invest in energy conservation within their apartment buildings. This suggests that planning for purposes of policy development proceed with great care and expertise. Furthermore, although Ernst and Whinney were able to define different types of landlords, they were not able to estimate the number of landlords by type nor the number of apartment units associated with each type.

FIGURE 2

POTENTIAL FINANCIAL INCENTIVE FOR LANDLORDS

	T1	T2	T3	T4
L1	II	I	IF	F
L2	CII	CI	CIF	CF
L3	CII	CI	CIF	CF

Legend

Landlord Type Relative to Rent Control Status

L1 Rent as function of expenses.

L2 Rent partially subject to controls.

L3 Rent uncontrolled.

Landlord Type Relative to Tax Status

T1 Fully taxable on rental income.

T2 Rental loss offsettable against other income.

T3 Not taxable on rental income - no offset.

T4 Not taxable at all.

Likely Financial Incentives

C Responsive to cost savings.

II Highly responsive to tax incentives.

I Possibly responsive to tax incentives.

F Cost savings equal cash savings because of tax rate.

Because of such complexity, policy initiatives are likely to be of advantage to one type of landlord, while at the same time being a disadvantage to others. This would result in an inequitable situation and could cause administrative havoc. With such a caution, it appears that EMR could gain more value for money by concentrating on information dissemination on the techniques of energy efficiency and effectiveness, the costs and the benefits, to landlords. A well organized series of regional seminars involving landlords, technical and financial experts, would be a big step forward in reaching this complex public.

PART FOUR: RELATED RESEARCH

Some related research or case studies have been carried out to demonstrate the feasibility of increasing energy conservation and of reducing energy cperating costs in apartment buildings. Three such demonstration studies are discussed in this Part. They are:*

- Katrakis;
- Boston; and
- Toronto.

4.1 Katrakis

The Katrakis demonstration was undertaken in Chicago during 1980-81, and focussed on a representative number of buildings which were typical of the majority of the rental housing stock in Chicago. Eight buildings were used ranging from four to twenty-five units. The buildings were gas-heated and cooperatively owned.

An energy audit was conducted by analyzing the utility bills, and the evaluation of the energy conservation measures was done by analyzing subsequent utility bills.

An energy management improvement program was implemented, involving both tenants and owners. The improvement program followed the process of:

- temperature reducing measures;
- heat loss reducing measures; and
- measures to improve the efficiency of existing space heating systems.

The primary emphasis of the program was on the latter measures but only after temperature and heat loss reducing measures had been introduced.

The average annual savings in utility bills (for all three types of measures) was $4,364 per building, a 37% reduction with an average simple payback of two years. With regard only to the measures to improve the efficiency of the existing gas heating systems, the average annual savings were $1,885 per building, a reduction of 22% with a simple payback of 1.8 years.

Given that the eight buildings are representative of 75% of the housing units in Chicago, the study concluded that

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* The particular projects are referred to by the names with which they are most commonly known.

"applying the same measures to all units would result in a potential annual savings of over $100 million for an initial investment of $200 million".

Some of the significant lessons learned from the energy management improvement program were as follows:

a. Basic program approach was first to implement measures which were known to be effective and which had the highest payback;

b. Energy conservation investments for the group were planned and executed without requiring any additional funds beyond the standard operating and maintenance budget;

c. Monitoring the performance of the systems and energy conservation measures and providing feedback on performance are important parts of the overall energy management program for the group; and

d. Some of the energy conservation work was initiated by an energy audit.

The barriers to improvement experienced during the program were:

- the lack of information about effectiveness of measures; and
- high cost and lack of financial incentive for equipment purchase and retrofit.

4.2 Boston*

The significance of the Boston Study was the unique methods of financing the energy conservation improvements, and the fact that rebates were actually made to tenants as a result of energy savings. This study was initiated in 1980 by the Citizens Conservation Corporation (CCC) and the Technical Development Corporation (TDC) in Boston. The program is designed for multi-family buildings in neighborhoods which are troubled but recoverable. The beneficiaries are low and moderate-income tenants and property owners, in both owner-occupied and investor-owned buildings. Master-metered

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* This information was presented in detail to EMR on December 16 - 17, 1982 by David Dayton and Stephen Morgan of the Technical Development Corporation, Boston, Massachusetts.

buildings in which the landlord pays directly the space heating bills were targeted because the owner's financial incentives to save are considered the strongest. The principle is that energy conservation investments will yield sufficient savings to retire the debt incurred to finance them and provide additional cash flow benefits to the energy consumer.

The first step in implementing the program is building owner outrearch. A single low-income neighborhood, Roxbury, was chosen to run the pilot because marketing efforts were presumed to be easier. A CCC organizer and the program manager used two methods to reach landlords: a door-to-door canvas and telephone calls to landlords referred by the local neighbourhood social service agency.

Buildings qualify only if a walk-through visit reveals that the building is indeed energy inefficient, but otherwise sound; that the tenants and landlord are not hostile to one another; and the landlord has paid his property taxes. Once a building is qualified, the landlord makes payments to a bank equal to his estimated pre-improvement energy expenditures. The bank finances the energy conservation improvements. The term of the loan is arranged so that the debt service charges are equal to or less than the cost of energy saved.

The bank then pays the fuel bills on a monthly budget basis, and deposits any remaining part of the landlord payments in an escrow account. The funds in this escrow account are mailed out at regular intervals two-three times per year during the coldest months to tenants. By mailing out the rebates during the coldest months, CCC rewards tenants at precisely the time when the opportunities for savings are greatest.

The landlord receives an improved building at no cost -- because his monthly payments to the bank are for the same amount of money he would have paid had he not participated in the program. Other landlord benefits include tax deductions for the interest paid, new banking relationships, community recognition, tenant morale and comfort, lower maintenance costs, and of course the full cash benefits of the energy savings after the first five years.

A tenant education program run by CCC staff trained in weatherization-materials installation and skilled in interpersonal communications instructs the tenants in ways to maximize their rebates, and ensure that any malfunctions or problems can be quickly corrected. The rebate reinforces energy efficient behaviour.

With the audit report from the engineering firm in hand, CCC utilizes a computer program developed by TDC to estimate dollar savings and cash improvements for the life of the loan and beyond. The computer program enables the landlord and the bank to vary the assumptions concerning interest rate, loan term, fuel inflation rate and/or first-year savings and view a recalculated cash flow seconds later. The cash flow printout has proved to be a useful educational and marketing tool for both landlords and bankers.

As of September 1982, the CCC program has received applications from 42 building owners covering 532 housing units. Of these, 12 buildings have been approved for bank loans; 26 more have been audited. Twelve buildings with 156 units are ready for construction; an additional ten units in two buildings have completed construction. The ten units completed were finished early in the 1981-82 heating season. The two five-unit wood-frame buildings finished have achieved 26% and 55% in oil savings respectively to date, surpassing the engineering projections.

The needs of individually metered buildings in which the tenants pay their own fuel bills can be met by adjusting the current program structure.

4.3 Toronto

The Toronto Study was conducted on behalf of the Ministry of Municipal Affairs and Housing of the Government of Ontario.*

This study was a demonstration project intended to : "guage the effectiveness of using a system of audits of past years' energy data from utility bills, workshops to train building owners and managers, and monitoring of on-going consumption in high-rise residential buildings".

There was joint financing in this demonstration project by Energy Ontario and the owners. The owners agreed to incur costs (if necessary) to implement changes within a building, up to a maximum of $5,000. The owners also supplied personnel to see that the program was carried out in each building. The Ontario Government paid for the audit(s), the workshops and the monitoring fees.

The demonstration program results were considered successful. The following were issues raised during the course of the project, which are likely to have significant impact on extending this type of project:

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* The study was managed by Engineering Interface Ltd. of Toronto, and is available from Ontario government bookstores.

a. "It was made very clear that equivalent energy management activity would not take place in buildings which were likely to go to rent review, since savings achieved would be deducted from allowed rent increases, and amortization periods for capital expenditures would be likely to cause negative short term cash flows."

b. Because of the variation in both airflow and operational requirements for ventilation systems in Ontario municipalities, the impact of these differences on effective energy conservation measures is substantial.

c. Necessary knowledge from a technological and energy conservation perspective for apartment building management was felt to be lacking.

d. Several participants suggested that "ways and means" are necessary to reduce installation and reading costs for individual meters in suites. It was known, that where tenants pay their own electricity bills, there is approximately a 35% reduction in electricity use compared to bulk metering.

4.4 Summary

In each of the three case studies discussed in this part, energy audits, energy management improvement programs, and monitoring of the results were considered essential to achieving energy conservation. In all three studies, two potential barriers to improvements were raised: financial incentives and lack of knowledge/information. An additional barrier was raised in the Toronto study, namely, the rent review system which was found to be a deterrent to achieving energy conservation in residential buildings.

However, as can be seen from the three case studies, small amounts of monies invested in energy conservation measures have significant paybacks in terms of both energy saved and reduced operating costs for individual buildings.

PART FIVE: A RANGE OF POLICY OPTIONS

This part begins with a discussion of the needs and opportunities for an appropriate policy. This is followed by an explanation of assumptions made in designing the options. Then, criteria for assessing the options are described. This is followed by the presentation, in summary fashion, of a range of policy options for increasing energy conservation and/or efficiency in existing and future medium and high-rise apartment buildings. Once a preferred direction for policy is selected, a more detailed assessment of options would be considered desirable.

5.1 Needs and Opportunities

The need for a policy to increase energy conservation and/or efficiency in existing (and future) medium and high-rise apartment buildings derives from their increasing energy costs. This is reflected in the owner's operating expenses, of which energy accounts for 25-40% of costs, second only to taxes and insurance. Apartment buildings do not appear to be attracted to the public policy initiatives designed for the vast majority of Canadian homeowners. There are too many barriers which inhibit energy conservation investments in the apartment building sector. The most obvious of these is the so-called "split-incentive" problem: landlords who pay their own heat cannot get or do not expect cooperation from their tenants in keeping their energy costs down; tenants who pay their own heat offer no incentive to the landlord to improve their building and heating systems to reduce the tenants' energy bills.

Apartment building landlords do not have the same benefit of government programs which single-family homeowners enjoy. In addition, the rental industry has experienced difficult cash flow problems, particularly during the past half-decade. Lacking available cash, reluctant to borrow because of high interest rates, and skeptical or uninformed about the potential savings generated from unfamiliar conservation devices and techniques, apartment building owners have incurred minimal conservation expenditures. Yet apartment buildings are generally attractive investments on a cost/

benefit basis. For example, in the United States, these buildings are older, more poorly insulated, and consume as much or more energy per square foot as do single-family residences. The reluctance of landlords and other investors to enter the field is understandable, but appropriate public sector involvement can stimulate a robust industry as energy prices gradually increase and experience with weatherizing these buildings accumulates over the next several years.

Publically initiated approaches to addressing apartment building energy conservation issues have been infrequently undertaken. The barriers have been severe. However, technological research and application of "ways and means" to reduce energy costs in apartment buildings have made significant gains in the past several years. What is lacking at this time is a greater application of these new methods. The provision of a one-stop conservation service which offers auditing, arranging for contracting, financing, and quality control would probably facilitate an energy conservation service for apartment buildings. Information and incentives for landlords and tenants would also facilitate, as would the availability of low cost financing. As energy prices rise and conservation experience accumulates in this building sector, the necessity for public sector involvement and subsidized financing should ultimately disappear.

5.2 Assumptions in Designing Policy Options

a. Energy Costs

By all accounts, the cost of energy will continue to rise. In the residential apartment building sectors, these costs represent anywhere from 25 to 40% of the operating costs of a building.

As energy costs increase, so do the operating costs of the buildings. This has two visible results: (a) rents increase; and (b) the owner has a less attractive cash flow, and is therefore less likely to make improvements, let alone have money to invest in energy conservation.

b. Energy Efficiency

Increased energy efficiency within a building is one way of reducing the owner's operating costs. And increased energy efficiency translates into energy savings for the owner.

c. Technology

With recent and continuing improvements in the technology of energy conservation, the methods for achieving energy savings are available. This applies not only to the technology itself, but to methods of applying the technology.

d. Applications

The most important step in achieving energy savings within an apartment building is the actual application of energy saving techniques. This requires three things: (a) knowledge of the energy saving techniques; (b) an energy management improvement program to implement the techniques; and finally (c) money and time.

e. Barriers

From a landlords perspective, the main barriers that are presently hindering a faster uptake of energy conservation measures in the residential apartment building sector are financial. A second important barrier is lack of information. Within the financial category, the principal barriers facing landlords are:

- federal tax system;
- provincial rent review system;
- lack of financial incentives;
- perceived high cost of conversions and retrofit;
- lack of available cash; and
- high cost of borrowing money.

Within the information category, the principal barriers facing landlords are:

- lack of information as to the actual costs and benefits of specific energy improvement methods;
- lack of knowledge as to what methods work and whether or not they are cost-effective;
- lack of knowledge as to how to introduce energy conservation measures;
- lack of awareness as to the benefits of energy conservation improvements;
- lack of credibility that once the methods are applied, they will in fact produce positive financial results; and

- lack of credibility in governments, in that even though positive results in energy savings are achieved, government(s) will use one way or another to remove financial incentives.

It is within the above framework of assumptions that policy options are developed and presented for consideration in Section 5.4.

5.3 Criteria for Assessing Policy Options

In addition to the assumptions discussed in the Section 5.2, the following criteria are considered important in the selection of one or more of the policy options. There is no intention here to rank these criteria by priority.

a. Federal Government Policies and Practice

Whatever policy option is considered for implementation, it must be in accord with existing federal government policies, especially the National Energy Program (NEP). In addition to the NEP policy, both restraint in government expenditures and job creation are considered important at this time in developing options. As well, the government preference for discouraging tax incentives must be considered.

b. Receptivity of Provincial/Territorial and Municipal Governments

Since housing is a provincial matter, the likelihood of direct federal initiatives other than information or incentive grants relative to residential apartment buildings is low, without the combined effort and cooperation of both levels of government. Therefore, sensitivity on the part of the federal government to provincial initiatives towards energy conservation in residential apartment buildings is considered an essential element of success.

c. Receptivity of Owners and Tenants

Within the residential sector, the end effects of policy and program will be felt by owners and likely by tenants. Avoiding direct conflict with either group is considered an important element of success for making the policy work and achieving positive program results. The needs and sensitivities of both groups must be taken into consideration. Of the two groups, it is the needs of the owners which are considered more important at this stage because it is they who will make the financial decisions on energy conservation improvements within their buildings.

d. Facility of Implementation and Management by Owners

A policy and program which is unnecessarily cumbersome will have a small chance of working, and is likely to cause more problems than the money and effort warrants.

It is the owners themselves who will make the decisions on the introduction of energy conservation measures in their apartments. And it is the owners' property managers (or appointed personnel) who will do the work to get results.

Energy conservation matters are simply one aspect of the overall operation of a building. A policy which complicates rather than enhances this operation is not likely to be workable.

e. Feasibility and Facility of Administration

From a federal and provincial government perspective, the policy and subsequent program should not result in the building of a large internal bureaucracy or administrative staff. It would be optimal if existing resources could be used to perform the necessary responsibilities of both federal and provincial governments, once the policy is decided and the program is implemented.

f. Stimulation to the Private Sector

Concern with energy conservation is a relatively new phenomenon in the private sector. New technologies have been developed and new energy saving products produced. The application of these technologies and products to the residential apartment building sector can act as a stimulant to private sector business development in the industries serving energy conservation. The policy and subsequent program should be designed in such a way that it encourages this potential in the private sector.

g. Increased Productivity

The policy and subsequent program should result in increased productivity. From a federal government perspective, this productivity increase can be measured by energy saved in the residential apartment sector. A productivity index of energy saved divided by program costs could indicate the cost effectiveness of the program. On a micro level, the same type of productivity index could be applied to a particular apartment building, giving the owner a measure as to whether or not his energy management program is cost effective.

h. Capacity to Evaluate the Results

On the assumption that the federal government could be funding one or more aspects of a program, a built-in mechanism for program evaluation is required. Without such a mechanism, there is no way for EMR to assess the cost-effectiveness of the program. A method of evaluation should be built into the program at the design stage.

5.4 Presentation of the Options

The range of options presented focusses on landlords because they are the first group of players that would have to be convinced of the benefits of energy conservation. Other options could be developed for the other players, however, limitations of time precluded such development in this paper. The options presented in this paper are:

#1 No changes or interventions;
#2 Direct and additional tax on heating oil;
#3 Tax incentives for increased energy efficiency;
#4 Grant to move off oil;
#5 Information program for specific groups.

The first option involves no additional effort by the federal government to increase energy conservation and/or efficiency in residential apartment buildings, and implies that landlords would eventually, in the long term, bring about the desired changes without any federal government incentive. However, the last four options involve additional action by the government and anticipate the implementation of energy conservation measures in the near future. These four options have certain benefits in common, although the precise impact and effects of each option have not been estimated. These benefits include:

(a) increase in off oil conversions in line with National Energy Program goal of reducing "the use of oil in the residential, commercial, and industrial sectors in every province to no more than 10% of the total energy used in these sectors";

(b) stimulate other energy forms (natural gas and electricity), the service industries (e.g., consulting engineering firms and audit energy companies), and product suppliers; and

(c) the energy saved (and oil displaced).

In general, these four options also require varying amounts of information gathering, analysis, and program planning before implementation.

A brief description of each option is presented, along with a preliminary discussion of its potential impacts. Because the common benefits (positive impacts) for Options #2 to #5 were discussed in the preceeding paragraph, the discussion on impacts may appear to focus more on negative impacts (e.g., costs and problems created during and after implementation).

OPTION #1: NO CHANGES OR INTERVENTIONS

Description

Essentially this policy option would not establish a new program directed towards energy conservation in residential apartment buildings of four (4) storeys and up.

This policy option is not a "do-nothing" policy. It is however, non-interventionist and relies on the natural market forces to achieve energy conservation in residential apartment buildings. It also relies on the "ripple" effect of existing information, research and technology transfer programs to impact on residential apartment landlords. Examples of the latter are the Building Technology and Support Program and the Commercial/Industrial Task Force, both of EMR. The "ripple" effect simply means that what is learned in these programs is likely to be picked up and applied by apartment landlords.

The rationale for this option is that technological information and methods of energy conservation are filtering down to the users, and that the private sector is making inroads on implementing technological changes resulting in increased energy conservation.

Potential Impact

An advantage of this option for the federal government is that it requires no new expenditures of funds. A possible advantage is that, since controversy arises when the federal government intervenes, there is likely to be no controversy because there is no intervention.

Though this option is the least costly to the federal government in terms of no new expenditures, it could be costly in terms of lost oportunity for energy savings. Measurement of this lost opportunity cost is not possible within this discussion paper; however, it is suspected that

there are considerable energy savings to be made in the residential apartment sector. A possible problem with this option is that the federal government and, in particular EMR, could be perceived to be doing nothing and therefore not providing leadership in energy conservation. This could present a serious public image problem among residential apartment landlords and other governments who look to EMR for such leadership.

The cost of "doing nothing" and therefore relying on natural market forces to achieve energy savings in apartment buildings has to be assessed against the cost of lost opportunity in terms of energy to be saved by implementing some new program.

OPTION #2: DIRECT AND ADDITIONAL TAX ON HEATING OIL

Description

This option would levy an additional and direct tax on heating oil as the primary source of energy in residential apartment buildings of four (4) storeys and up. (The specifics of how this tax might be levied and collected are not discussed here.)

This option is a form of negative coercion. With sufficient advanced notice of intent, it could be applied in areas where there are cheaper fuel alternatives.

Potential Impact

This option is likely to be perceived as an unfair, unpopular measure, unless applied differentially by region where there is no other presently available energy source. However, it could be very difficult to implement such a regional oriented option. From a user perspective, the option can be considered very punitive, since oil users in apartment buildings may not be the biggest energy wasters; they could, in fact, be energy conservers. Finally, the option could also impact negatively on the oil supply industry if too many conversions occur too fast.

OPTION #3: TAX INCENTIVES FOR INCREASED ENERGY EFFICIENCY

Description

This option would provide some form of incentive in the tax system such as tax credit, tax write-off, or capital cost allowance, that would encourage residential apartment owners to be more efficient in their consumption of energy. This incentive could be applied against specific (capital) equipment or against a change in operations or procedures.

Program implementation evolving from this option would require an acceptable energy audit in a "before and after" situation to quantify the energy savings increase.

Potential Impact

The advantage of this option is that it would be a positive incentive for those owners who would be eligible for or who need such tax benefits to increase energy savings within their buildings.

This option, and variations on it, could be difficult for the government to administer because specific measures and equipment would have to be declared eligible in an ever changing technological environment. In addition, as suggested in Part Three, this option may in fact be of limited value because of the complex nature of the tax status of some landlords. Furthermore, designing a system to monitor the "before and after" energy audits and to link it to a tax incentive could be administratively very expensive. The option is likely to be unpopular with both the Departments of Finance and National Revenue.

Without more knowledge of the economic and fiscal impacts of such incentives, it is difficult to suggest that this option be pursued at this time. If the intent and direction are reasonable, detailed analysis of the costs and benefits of each type of tax incentive are warranted.

OPTION #4: GRANT TO MOVE OFF OIL

Description

This option would provide a grant to landlords of residential apartment buildings who wish to undertake approved energy conservation measures within their buildings. It is similar in concept to the Canadian Oil Substitution Program (COSP) and the Canadian Home Insulation Program (CHIP). The use of the grant could be kept flexible so that it could be applied for purposes of an energy audit and/or a conversion program. (This represents a change from present policy.)

Potential Impact

One advantage to this option is ease of implementation, partly because of the existing infrastructure, both within EMR and in the service industries due to existing programs such as COSP and CHIP.

The disadvantages of this option would be the complexity of administration and the difficulties of selecting individual buildings that would be eligible for the grant. The costs are not known but could be very high depending on the rate of uptake by landlords. Another problem area would be determining the amount of the grant relative to building size, determining the precise work that needs to be done and the monitoring of work undertaken under the auspices of the grant.

OPTION #5: INFORMATION PROGRAM FOR SPECIFIC GROUPS

Description

This option would provide an information package directed towards specific landlord groups, illustrating the benefits and costs of undertaking energy conservation measures. The rationale for this option is that there have been significant applications of energy efficient measures with positive results in the last few years.

This option envisions a combined and coordinated effort, led by EMR, of federal departments and agencies and provinces in providing useful and accurate information to the residential apartment sector. As well, this option would capitalize on various national networks that already exist in the public, such as the Building Owners' and Managers' Association (BOMA), the provincial governments, utility companies, and various tenant associations - to spread information on new materials and technologies.

Potential Impact

The major advantage of this option is that it has a low cost to the federal government with the likelihood of significant benefits. At the same time, the impetus to make improvements in energy conservation rests with the private sector.

The disadvantages of this option is that there is no built-in mechanism to assure that energy savings are made. Information by itself is not sufficient to guarantee this. As well, there is no straightforward way to evaluate the program. Though costs to produce and distribute information are relatively low, the actual savings on energy as a result of using the information are not readily measurable.

5.5 Conclusions

Of the five options presented, it appears that Option #5, Information Program for Specific Groups, meets most of the criteria presented in Section 5.3, with the exception of

criterion (h) - capacity to evaluate the results.

Option #2, Direct and Additional Tax on Heating Oil, is the least likely to meet the majority of the criteria. Also, because of its punitive nature, it is likely to be politically unacceptable at any level of government and the private sector.

Option #3, Tax Incentives for Increased Energy Efficiency, initially appears attractive. However, because of its apparent complexity and difficulty in administration, it currently meets few of the criteria. However,further research may be warranted in this area.

Option #4, Grant to Move Off Oil, meets several of the criteria, but is likely to be politically unacceptable at this time.

Finally, Option #1, No Changes or Interventions, avoids the question altogether as to how EMR can positively influence energy conservation in the multi-residential sector.

The most attractive option, given the state of technological information on energy conservation and the lack of applications in Canada, lies in the area of information and communications. Part Six, the final part of this discussion paper, presents a possible integrated program scenario.

PART SIX: A POSSIBLE INTEGRATED PROGRAM SCENARIO

On the assumption that EMR has to proceed in the near future with an energy conservation program applicable to residential apartment buildings, this part suggests an integrated program scenario for discussion and consideration. Implementation of this integrated program can proceed while further research, development, and analytical work is done on the policy options presented in Part Five. The suggested integrated program has a low risk and a high possibility of return.

6.1 Program Objectives and Anticipated Results

The objectives of this integrated program are to provide information and techniques to landlords, tenants and service industries which will result in:

a. an increase in energy efficiency in residential apartment buildings; and,

b. a decrease in the reliance on and consumption of oil as a major energy source in residential apartment buildings.

From the information collected and reviewed, the following two conditions must be satisfied for the program to successfully achieve the anticipated results:

a. The program must be cost-effective from both the federal government and the owner perspective. From the federal government perspective, cost-effectiveness can be assessed on a value for money basis: how much money is put into the program and what is the energy savings. From the owner perspective, cost-effectiveness can be assessed by how much it costs the landlord to participate in the program, and if he does participate what is his savings in dollars as a result of energy consumption decreases.

b. It must be possible to maintain energy savings beyond the pro-active period of the energy management program. This condition precludes short term gains with long term losses. Maintenance of results in terms of energy savings must be possible over a reasonable period of time.

6.2 Integrated Program Description

There are two parts to the program envisioned below. Part 1 is an Energy Management Information System, and Part 2 is an Energy Management Improvement Program. The two are complementary, yet at the same time they could be mutually exclusive, though this is not considered desirable.

Energy Management Information System (EMIS)

EMIS has two major activities. The first refers to the collection, updating and maintenance of information on the latest methods and techniques of implementing energy savings in residential apartment buildings. This can be referred to as the internal information activity. The second EMIS activity contains the dissemination of accurate and reliable information to the various users to help introduce energy savings in apartment buildings. This could be called the public information activity.

Energy Management Improvement Programs (EMIP)

EMIP has three major activities:

a. energy audits which would point out the conservation opportunities, costs and benefits;

b. energy management application projects in a particular building or group of buildings; and,

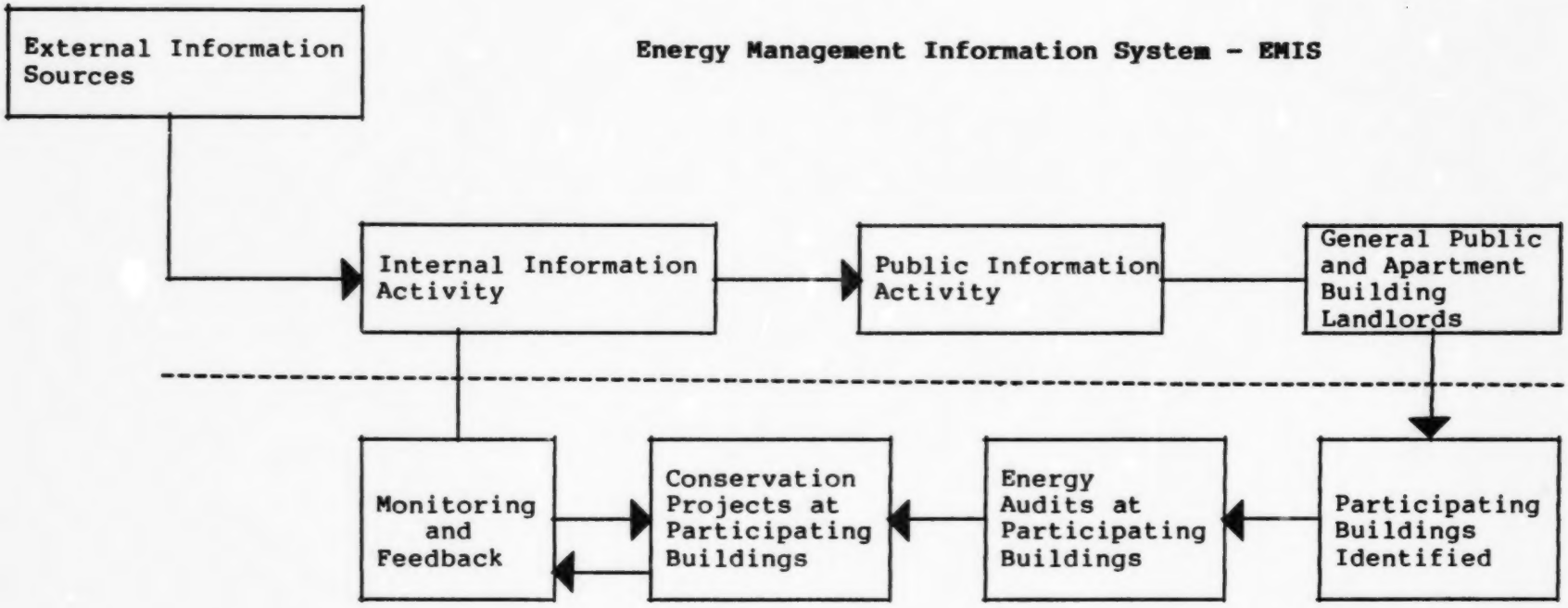
c. systematic monitoring of ongoing results of particular energy management application projects, and providing feedback of results to participants and to EMIS for subsequent use in new applications.

The parts and major activities of the integrated program are illustrated in Figure 3.

Internal Information Activity of EMIS

This activity of EMIS is based on the need for accurate and reliable information on the various materials and methods of conserving energy in residential apartment buildings. It also envisions up-to-date information on the residential apartment building stock within Canada, and the subsequent status of energy conservation measures and technologies

Figure 3 - POTENTIAL SCENARIO FOR INTEGRATED ENERGY MANAGEMENT PROGRAM


External Information Sources
Energy Management Information System - EMIS
Internal Information Activity
Public Information Activity
General Public and Apartment Building Landlords
Monitoring and Feedback
Conservation Projects at Participating Buildings
Energy Audits at Participating Buildings
Participating Buildings Identified
Energy Management Improvement Program - EMIP

applied within these buildings. No such system exists within Canada, though there is a multitude of published and written information. Consolidation of such information within one centre would raise the likelihood of the information being readily accessible by those who need and want it. EMR could fund the design and development of the system. These costs could be recovered over a period of time by charging a fee to users once the system becomes operational.

Public Information Activity of EMIS

This activity of the EMIS is based on the need to disseminate accurate and useful information on energy conservation in residential apartment buildings to decision makers and users.

There already exists a number of publications and networks, such as the Building Owners' and Managers' Association (BOMA) and the Canadian Property Managers' Association (CPMA). As well, utility companies frequently distribute conservation information as part of their customer service. There is a need to target a public information program to landlords and their financial advisors, who are the ones likely to make the decisions to implement energy conservation management application projects. Further study of this diversified target group is presently underway in a landlord component of the CHIP evaluation sponsored by EMR. The results of this work should give some indication of landlord willingness to undertake improvement projects.

A public information program is an essential ingredient to program uptake. Once specific elements of the integrated program are approved, design of the public information system can start.

Energy Audit Activity of EMIP

Conducting energy audits is the first step in determining the energy consumption in particular residential apartment buildings. Until such time as an audit is undertaken on a particular building, the landlord is only guessing (though this might be a learned guess) as to what his energy costs are and various methods of reducing these costs. Using the example of the Engineering Interface method of providing an energy audit, it is possible that such audits could cost less than $1000 for a standard building. This is sufficient for

the landlord to know where he stands on energy consumption relative to other similar type buildings, and what steps are likely, in a logical progression, to improve his energy use.

Energy Management Application Projects Activity of EMIP

The purpose of the energy management application projects is simply to show landlords, investors and other participants how the technology can be applied and generate benefits, and to produce more information on the problems and benefits associated with the application of these technologies.

There are two types of costs (soft and hard) associated with energy management application projects. Examples of soft costs are: energy audit, the program itself, training and dissemination of information. EMR could consider the funding of the soft costs of approved energy management application projects.

Hard costs are associated with the purchase of equipment, materials, and labour to make the energy saving improvements within a building. In the case of hard costs, EMR could consider low interest loans or guaranteed loans for approved projects.

Monitoring Activity of EMIP

Regardless of which type of costs might be funded by EMR in energy management application projects, a system for continually monitoring and auditing the program results and feedback of results to the participants and the EMIS would be required.

Not only would such a system protect the public interest, it would also provide an assessment as to program effectiveness, and feedback accurate information on successful and problematic applications to EMIS. This in turn could be used for future input to other energy management application projects and for the transfer of such knowledge to other potential users.

The establishment of such a monitoring system is not foreseen as a difficult undertaking. As long as appropriate criteria are established, the actual monitoring of ongoing results could be conducted by certified personnel in the private sector. The cost for monitoring of results could be borne by EMR.

6.3 Concluding Remarks

There remain several unanswered questions before a specific program can be operationalized. The primary one is the preferred policy direction. The second one is the degree of participation and the amount of funding the federal government would be willing to contribute. By all accounts, there are opportunities for significant energy savings in the residential apartment sector. The federal government does have the opportunity to play both a leadership and catalytic role. Because of the complexity of landlord types, the lack of information in the hands of users, and therefore the lack of applications of energy conservation measures, an active role and funding in the area of information and communications can be justified.

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APPENDIX B: ACKNOWLEDGEMENTS

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